

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

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30.    (new)

An intravenous oxygenator for enriching blood with oxygen, said oxygenator having a twisted bundle of fibers allowing through flow of oxygen and carbon dioxide therealong, said fibers being each connected to a gas supply means through a first connection and to a gas evacuation means through a second connection so that oxygen and carbon dioxide are allowed to flow through the fibers from the first connections to the second connections, the fiber bundle being twisted by relative rotation of the first connections of the fibers relative to the second connections of the fibers about a longitudinal axis of the oxygenator, **wherein** a neighboring bundle of fibers, which is disposed in series with the bundle of fibers along the oxygenator, is twisted in the same direction.

31.    (new)

The intravenous oxygenator as set forth in claim 30, **wherein** the connections are relatively rotated from 90° to 300°, preferably from 150° to 270°, more preferably about 240°, per

30 mm fiber length.

32. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** at least a multiplicity, preferably at least a plurality, of the fibers are inclined, in their extension between the connections, at an angle of from  $30^{\circ}$  to  $75^{\circ}$ , preferably of from  $42^{\circ}$  to  $71^{\circ}$ , particularly of about  $62^{\circ}$ , to the longitudinal axis if the longitudinal axis and the fiber orientation are projected onto a projection cylinder that is coaxial with the longitudinal axis.

33. (new)

The intravenous oxygenator as set forth in claim 32, **wherein** the fibers are in the angular range mentioned over a major part of their length.

34. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** the twisted bundle of fibers rests against an impermeable sheathing on the outside thereof.

35. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** the twisted bundle of fibers has a diameter of from 15 to 30 mm,

preferably from 15 to 25 mm.

36. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** the connections of the twisted bundle of fibers are secured against untwisting themselves.

37. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** means for limiting further relative rotation of the connections of the twisted bundle of fibers.

38. (new)

The intravenous oxygenator as set forth in claim 36, **wherein** securement or limitation may be achieved by providing a frictional connection between a first fiber holder and a second fiber holder, with said fiber holders being connected to the connections.

39. (new)

An intravenous oxygenator for insertion into a vein having a bundle of fibers allowing through flow of oxygen and carbon dioxide therealong, said fibers being each connected to a gas supply means through a first connection and to a gas evacuation

means through a second connection so that oxygen and carbon dioxide are allowed to flow through the fibers from the first connections to the second connections, said connections being respectively connected to a first and to a second fiber holder and being displaceable along a longitudinal axis of the oxygenator, **wherein** the fiber holders are sliding bodies that are rotatable relative to one another about the longitudinal axis of the oxygenator, more specifically relative to the central catheter, and that are mounted so as to be displaceable preferably along said axis.

40. (new)

The intravenous oxygenator as set forth in claim 39, **comprising** a first driver provided on the first fiber holder and a second driver provided on the second fiber holder, said drivers being directed toward each other and allowing rotation of the first fiber holder relative to the second fiber holder at least in one direction of rotation up to a rotation limit only without the second fiber holder being carried along when the two fiber holders are pressed into contact with each other.

41. (new)

The intravenous oxygenator as set forth in claim 40, **wherein** the rotation limit is a relative rotation of from 90° to 300°,

preferably of from 150° to 270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

42. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** an abutment device provided on fiber holders for limiting a displacement of the connections relative to one another.

43. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** fiber holders are disposed in the inner volume of the bundle of fibers.

44. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a substantially elastic bond between two fiber holders.

45. (new)

The intravenous oxygenator as set forth in claim 44, **wherein** the elastic bond comprises a membrane and/or a linear spring.

46. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a spiral guidance means for guiding fiber holders along the longitudinal axis of the oxygenator.

47. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a blood pump for pumping blood through the bundle of fibers.

48. (new)

The intravenous oxygenator as set forth in claim 30, **wherein**, when the bundle of fibers is twisted, there is equilibrium of moments between the fibers and the force-transmitting bonds between the connections.

49. (new)

The intravenous oxygenator as set forth in claim 48, **wherein** it is assumed that the equilibrium of moments is achieved with a relative rotation of from 90° to 300°, preferably of from 150° to 270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

50. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a housing with an impermeable sheathing that is deformable in the radial direction in particular.

51. (new)

The intravenous oxygenator as set forth in claim 50, **wherein** the housing can expand to a diameter of 30 mm at the most, more specifically of 25 mm at the most.

52. (new)

The intravenous oxygenator as set forth in claim 50, **comprising** a wire grate used as the carrier structure of the housing.

53. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a gear connected to a bundle of fibers.

54. (new)

The intravenous oxygenator as set forth in claim 53, **wherein**, on a rotation device for twisting a plurality of fiber bundles connected in series, a gear is provided between the rotation device and a bundle of fibers in such a manner that the

gear transmits a rotation of the rotation device onto the bundles of fibers at a ratio corresponding to the number of fiber bundles or to a ratio of the overall length of the bundles of fibers to a scale length.

55. (new)

An intravenous oxygenator for insertion into a vein having a bundle of fibers allowing through flow of oxygen and carbon dioxide therealong, said fibers being each connected to a gas supply means through a first connection and to a gas evacuation means through a second connection so that oxygen and carbon dioxide are allowed to flow through the fibers from the first connections to the second connections, said connections being respectively connected to a first and to a second fiber holder and being displaceable along a longitudinal axis of the oxygenator, **wherein** the fiber holders are mounted so as to be rotatable relative to one another about the longitudinal axis of the oxygenator and to be displaceable preferably along said axis and further comprising a first driver provided on the first fiber holder and a second driver provided on the second fiber holder, said drivers being directed toward each other and allowing rotation of the first fiber holder relative to the second fiber holder at least in one direction of rotation up to a rotation limit only without the second fiber holder being carried along



when the two fiber holders are pressed into contact with each other.

56. (new)

The intravenous oxygenator as set forth in claim 55, **wherein** the rotation limit is a relative rotation of from 90° to 300°, preferably of from 150° to 270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

57. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** an abutment device provided on fiber holders for limiting a displacement of the connections relative to one another.

58. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** fiber holders are disposed in the inner volume of the bundle of fibers.

59. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a substantially elastic bond between two fiber holders.

60. (new)

The intravenous oxygenator as set forth in claim 59, **wherein** the elastic bond comprises a membrane and/or a linear spring.

61. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a spiral guidance means for guiding fiber holders along the longitudinal axis of the oxygenator.

62. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a blood pump for pumping blood through the bundle of fibers.

63. (new)

The intravenous oxygenator as set forth in claim 30, **wherein**, when the bundle of fibers is twisted, there is equilibrium of moments between the fibers and the force-transmitting bonds between the connections.

64. (new)

The intravenous oxygenator as set forth in claim 63, **wherein** it is assumed that the equilibrium of moments is achieved with a relative rotation of from 90° to 300°, preferably of from 150° to

270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

65. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a housing with an impermeable sheathing that is deformable in the radial direction in particular.

66. (new)

The intravenous oxygenator as set forth in claim 65, **wherein** the housing can expand to a diameter of 30 mm at the most, more specifically of 25 mm at the most.

67. (new)

The intravenous oxygenator as set forth in claim 65, **comprising** a wire grate used as the carrier structure of the housing.

68. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a gear connected to a bundle of fibers.

69. (new)

The intravenous oxygenator as set forth in claim 68, **wherein**, on a rotation device for twisting a plurality of fiber bundles connected in series, a gear is provided between the rotation device and a bundle of fibers in such a manner that the gear transmits a rotation of the rotation device onto the bundles of fibers at a ratio corresponding to the number of fiber bundles or to a ratio of the overall length of the bundles of fibers to a scale length.

70. (new)

An intravenous oxygenator for insertion into a vein having a bundle of fibers allowing through flow of oxygen and carbon dioxide therealong, said fibers being each connected to a gas supply means through a first connection and to a gas evacuation means through a second connection so that oxygen and carbon dioxide are allowed to flow through the fibers from the first connections to the second connections, said connections being respectively connected to a first and to a second fiber holder and being displaceable along a longitudinal axis of the oxygenator, **wherein** the fiber holders are mounted so as to be rotatable relative to one another about the longitudinal axis of the oxygenator and to be displaceable preferably along said axis and further comprising an abutment device provided on fiber

holders for limiting displacement of the connections relative to one another.

71. (new)

The intravenous oxygenator as set forth in claim 70, **comprising** a first driver provided on the first fiber holder and a second driver provided on the second fiber holder, said drivers being directed toward each other and allowing rotation of the first fiber holder relative to the second fiber holder at least in one direction of rotation up to a rotation limit only without the second fiber holder being carried along when the two fiber holders are pressed into contact with each other.

72. (new)

The intravenous oxygenator as set forth in claim 71, **wherein** the rotation limit is a relative rotation of from 90° to 300°, preferably of from 150° to 270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

73. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** fiber holders are disposed in the inner volume of the bundle of fibers.

74. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a substantially elastic bond between two fiber holders.

75. (new)

The intravenous oxygenator as set forth in claim 74, **wherein** the elastic bond comprises a membrane and/or a linear spring.

76. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a spiral guidance means for guiding fiber holders along the longitudinal axis of the oxygenator.

77. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a blood pump for pumping blood through the bundle of fibers.

78. (new)

The intravenous oxygenator as set forth in claim 30, **wherein**, when the bundle of fibers is twisted, there is equilibrium of moments between the fibers and the force-transmitting bonds between the connections.

79. (new)

The intravenous oxygenator as set forth in claim 78, **wherein** it is assumed that the equilibrium of moments is achieved with a relative rotation of from 90° to 300°, preferably of from 150° to 270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

80. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a housing with an impermeable sheathing that is deformable in the radial direction in particular.

81. (new)

The intravenous oxygenator as set forth in claim 80, **wherein** the housing can expand to a diameter of 30 mm at the most, more specifically of 25 mm at the most.

82. (new)

The intravenous oxygenator as set forth in claim 80, **comprising** a wire grate used as the carrier structure of the housing.

83. (new)

The intravenous oxygenator as set forth in claim 30,  
**comprising** a gear connected to a bundle of fibers.

84. (new)

The intravenous oxygenator as set forth in claim 83,  
**wherein**, on a rotation device for twisting a plurality of fiber bundles connected in series, a gear is provided between the rotation device and a bundle of fibers in such a manner that the gear transmits a rotation of the rotation device onto the bundles of fibers at a ratio corresponding to the number of fiber bundles or to a ratio of the overall length of the bundles of fibers to a scale length.

85. (new)

An intravenous oxygenator for insertion into a vein having a bundle of fibers allowing through flow of oxygen and carbon dioxide therealong, said fibers being each connected to a gas supply means through a first connection and to a gas evacuation means through a second connection so that oxygen and carbon dioxide are allowed to flow through the fibers from the first connections to the second connections, said connections being respectively connected to a first and to a second fiber holder and being displaceable along a longitudinal axis of the



oxygenator, **wherein** the fiber holders are mounted so as to be rotatable relative to one another about the longitudinal axis of the oxygenator and to be displaceable preferably along said axis and further comprising a spiral guidance means for guiding fiber holders along the longitudinal axis of the oxygenator.

86. (new)

The intravenous oxygenator as set forth in claim 85, **comprising** a first driver provided on the first fiber holder and a second driver provided on the second fiber holder, said drivers being directed toward each other and allowing rotation of the first fiber holder relative to the second fiber holder at least in one direction of rotation up to a rotation limit only without the second fiber holder being carried along when the two fiber holders are pressed into contact with each other.

87. (new)

The intravenous oxygenator as set forth in claim 86, **wherein** the rotation limit is a relative rotation of from  $90^{\circ}$  to  $300^{\circ}$ , preferably of from  $150^{\circ}$  to  $270^{\circ}$ , particularly preferred of about  $240^{\circ}$ , for each 30 mm fiber length between the two fiber holders.

88. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** an abutment device provided on fiber holders for limiting a displacement of the connections relative to one another.

89. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** fiber holders are disposed in the inner volume of the bundle of fibers.

90. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a substantially elastic bond between two fiber holders.

91. (new)

The intravenous oxygenator as set forth in claim 88, **wherein** the elastic bond comprises a membrane and/or a linear spring.

92. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a blood pump for pumping blood through the bundle of fibers.

93. (new)

The intravenous oxygenator as set forth in claim 30, **wherein**, when the bundle of fibers is twisted, there is equilibrium of moments between the fibers and the force-transmitting bonds between the connections.

94. (new)

The intravenous oxygenator as set forth in claim 93, **wherein** it is assumed that the equilibrium of moments is achieved with a relative rotation of from 90° to 300°, preferably of from 150° to 270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

95. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a housing with an impermeable sheathing that is deformable in the radial direction in particular.

96. (new)

The intravenous oxygenator as set forth in claim 95, **wherein** the housing can expand to a diameter of 30 mm at the most, more specifically of 25 mm at the most.

97. (new)

The intravenous oxygenator as set forth in claim 95, **comprising** a wire grate used as the carrier structure of the housing.

98. (new)

The intravenous oxygenator, more specifically as set forth in claim 30, **comprising** a gear connected to a bundle of fibers.

99. (new)

The intravenous oxygenator as set forth in claim 98, **wherein**, on a rotation device for twisting a plurality of fiber bundles connected in series, a gear is provided between the rotation device and a bundle of fibers in such a manner that the gear transmits a rotation of the rotation device onto the bundles of fibers at a ratio corresponding to the number of fiber bundles or to a ratio of the overall length of the bundles of fibers to a scale length.

100. (new)

An intravenous oxygenator for insertion into a vein having a bundle of fibers allowing through flow of oxygen and carbon dioxide therealong, said fibers being each connected to a gas supply means through a first connection and to a gas evacuation

means through a second connection so that oxygen and carbon dioxide are allowed to flow through the fibers from the first connections to the second connections, said connections being respectively connected to a first and to a second fiber holder and being displaceable along a longitudinal axis of the oxygenator, **wherein** the fiber holders are mounted so as to be rotatable relative to one another about the longitudinal axis of the oxygenator and to be displaceable preferably along said axis and further comprising a housing with an impermeable sheathing that is deformable in the radial direction in particular.

101. (new)

The intravenous oxygenator as set forth in claim 100, **comprising** a first driver provided on the first fiber holder and a second driver provided on the second fiber holder, said drivers being directed toward each other and allowing rotation of the first fiber holder relative to the second fiber holder at least in one direction of rotation up to a rotation limit only without the second fiber holder being carried along when the two fiber holders are pressed into contact with each other.

102. (new)

The intravenous oxygenator as set forth in claim 101, **wherein** the rotation limit is a relative rotation of from 90° to

300°, preferably of from 150° to 270°, particularly preferred of about 240°, for each 30 mm fiber length between the two fiber holders.

103. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** an abutment device provided on fiber holders for limiting a displacement of the connections relative to one another.

104. (new)

The intravenous oxygenator as set forth in claim 30, **wherein** fiber holders are disposed in the inner volume of the bundle of fibers.

105. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a substantially elastic bond between two fiber holders.

106. (new)

The intravenous oxygenator as set forth in claim 104, **wherein** the elastic bond comprises a membrane and/or a linear spring.

107. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a spiral guidance means for guiding fiber holders along the longitudinal axis of the oxygenator.

108. (new)

The intravenous oxygenator as set forth in claim 30, **comprising** a blood pump for pumping blood through the bundle of fibers.

109. (new)

The intravenous oxygenator as set forth in claim 30, **wherein**, when the bundle of fibers is twisted, there is equilibrium of moments between the fibers and the force-transmitting bonds between the connections.

110. (new)

The intravenous oxygenator as set forth in claim 109, **wherein** it is assumed that the equilibrium of moments is achieved with a relative rotation of from  $90^{\circ}$  to  $300^{\circ}$ , preferably of from  $150^{\circ}$  to  $270^{\circ}$ , particularly preferred of about  $240^{\circ}$ , for each 30 mm fiber length between the two fiber holders.

111. (new)

The intravenous oxygenator as set forth in claim 100, **wherein** the housing can expand to a diameter of 30 mm at the most, more specifically of 25 mm at the most.

112. (new)

The intravenous oxygenator as set forth in claim 110, **comprising** a wire grate used as the carrier structure of the housing.

113. (new)

The intravenous oxygenator, as set forth in claim 30, **comprising** a gear connected to a bundle of fibers.

114. (new)

The intravenous oxygenator as set forth in claim 113, **wherein**, on a rotation device for twisting a plurality of fiber bundles connected in series, a gear is provided between the rotation device and a bundle of fibers in such a manner that the gear transmits a rotation of the rotation device onto the bundles of fibers at a ratio corresponding to the number of fiber bundles or to a ratio of the overall length of the bundles of fibers to a scale length.



115. (new)

An intravenous oxygenator for enriching blood with oxygen, said oxygenator having a plurality of bundles of fibers allowing through flow of oxygen and carbon dioxide therealong, more specifically as set forth in claim 30, said fibers being each connected to a gas conduit system through a first connection and through a second connection so that oxygen and carbon dioxide are allowed to flow through the fibers from the first connections to the second connections, **comprising** a mixing channel allowing through flow of gas therealong between different connections for generating a flow that is parallel to the flow through the fibers.

116. (new)

The intravenous oxygenator as set forth in claim 115, **wherein** flow resistances of the fibers and of the mixing channel during passage through the oxygenator effect a volume flow ratio of at least 4:1 (flow in the mixing channel to flow in the fibers).

117. (new)

The intravenous oxygenator as set forth in claim 115, **wherein** the mixing channel is an annular channel between a one-lumen catheter and the fibers.